SPECIFICATIONS *and* DETAILS

Masonite

MANUFACTURED LUMBER FOR

STRUCTURAL INSULATION

as applied for

Sheathing, Plaster Base, Interior Finish, Sound Deadening, and Insulation for Roofs, Walls, Floors and Ceilings

Together with tables for quick determination of heat loss through various types of roofs, and tables covering condensation in various types of structures

File A. I. A. 37-a1—MASONITE STRUCTURAL INSULATION—SPECIFICATIONS

MASON FIBRE COMPANY
111 W. WASHINGTON ST., CHICAGO

CONTENTS

Masonite

MANUFACTURED LUMBER FOR

STRUCTURAL INSULATION

Masonite is a manufactured board, made entirely of wood fibre. It retains the natural strength and composition of wood, but is so made that a high degree of insulating value is added.

In the Mason Process of producing this scientific wood product, clean wood chips are exploded under high steam pressure, so that the wood is reduced to fibre. The pulp thus produced consists entirely of long cellulose fibres, with their strength unimpaired and the lignins, or natural cementing structure of the wood, entirely retained. No chemicals are used; the exploding process is purely a physical one, so that there is no change in the wood except tearing it apart into natural fibres.

Because the Mason Process has succeeded in producing a long fibre pulp without the use of chemical processes, the Mason Fibre Company is able to fabricate a board with the natural strength and composition of wood—an achievement never before attained.

Masonite Structural Insulation, as you buy it, is simply this long fibre pulp pressed into board form. No binder is added to the pulp. The natural cementing matter of the wood being unharmed, nothing but pressure is needed to form the fibres into structural board. This pressure is applied hydraulically until the required degree of hardness is obtained. It is possible, therefore, to fabricate *Masonite* in various degrees of density, suiting the formation to the service the board is to perform.

Masonite Structural Insulation (the subject of this book) is pressed to a point which gives it the proper amount of structural rigidity, but still maintains great insulating value by leaving a myriad of minute air cells in and between the fibres. As a result this material combines structure and insulation to a degree that has heretofore been difficult to find.

MASON FIBRE COMPANY

1420 CONWAY BLDG., 111 W. WASHINGTON ST., CHICAGO

Where to use Masonite

Wide-spread field of application made possible by Masonite's combination of structural and insulating qualities

The specifications listed in this book indicate the great spread of uses for *Masonite Structural Insulation*. Probably no other single building material fits such a great variety of jobs as this one. Its smooth, uniform boards, 4 feet wide and 8, 9, 10 or 12 feet long, can be handled, sawed, cut and nailed like wood, because it is wood.

Only the most common uses are discussed here; the more unusual ones being reserved for other bulletins.

As Sheathing

Probably the most common use of *Masonite* in building is sheathing. Under frame, brick, stone or stucco exterior walls it replaces other materials without increase in cost, but with a great increase in the value of the building. The added insulation meets every demand of the present day trend toward insulated buildings, and shows amazing results in the reduction of heating costs, additional comfort in winter and summer, and greater rigidity and strength in the structure.

Three important factors of saving should be noted wherever *Masonite* is used for sheathing. *Labor Costs* are reduced by the increased rapidity and ease with which the big, uniform boards go into place. *Building paper* is eliminated, being unnecessary on any Masonized building. *Waste* is cut to the irreducible minimum.

As Plaster Base

Wherever *Masonite* is used as a plaster base, it puts an end to all controversy about the use of a substitute for lath. The introduction of *Masonite* in shiplapped boards, 2 feet by 4 feet, has brought such uniformly excellent results that even the most skeptical builders acclaim it as a fundamental improvement in plastering practice.

Masonite Insulating Lath (as covered in Specification No. 3, page 6) is uniformly furnished in bundles of 100 sq. feet and shiplapped along both 4-foot edges. Applied in staggered arrangement, it makes an exceedingly strong, rigid base. The action of this base under moisture is one of the remarkable features that causes exceedingly favorable comment everywhere. As shown by the tests described on page 14, *shrinking and swelling are practically eliminated*, a truly amazing fact! Walls plastered on *Masonite Insulating Lath* remain smooth and even.

Note particularly that *Masonite Insulating Lath* requires no special treatment nor reinforcement, because joints are broken every 2 feet. The only exception to this rule is at the corners, where strips of metal lath are recommended.

As Interior Finish

Masonite's surface suits it particularly well for use as an interior finish. It is smooth, with just enough texture and mottling to provide an interesting surface.

Used in its natural state, it makes a very pleasing paneled wall, decidedly out of the ordinary in effect.

Stain, plastic paint, or textured wall finishes may be applied direct to the board. Paint or varnish should be applied over a size or priming coat.

Because of its surface texture, *Masonite* has won recognition as an interior finish from many builders who have heretofore questioned the use of similar materials for this purpose. Being a true wood product, *Masonite* eliminates the artificial, "temporary" look common to similar partitions, and provides a substantial permanent wall.

In covering joints, the usual plan of wood battens is applicable. More artistic finishes, in a great variety of paneled effects, may be secured by the use of special *Masonite* battens or fancy moldings.

As Roof Insulation

To stop heat losses through the roof, *Masonite* may be applied in a number of ways, making it possible to reduce fuel costs in every type of building.

The recommended practice for application of *Masonite* on the outer roof of houses with wood rafters calls for application of *Masonite* directly over the rafters, so that the entire roof is lined with insulation. The usual wood sheathing is then nailed over the *Masonite*, with boards spaced 1 inch apart. This well insulated roof serves as an excellent base for wood shingles, asbestos shingles, earthen tile and asphalt shingles.

On buildings already constructed, the desired insulation may be secured by application of *Masonite* under the rafters.

Over concrete and wood decks, where the flat, exposed surface often leads to tremendous heat losses, *Masonite* is a particularly effective insulation. Nailed or mopped to the wood, or mopped onto the concrete, it serves equally well. Exact figures on heat losses and how they may be reduced, are given in detail in the chart facing page 16. We advise careful study of these figures. Special specifications for various types of roof insulation not covered in detail in this booklet may be had by writing to the Mason Fibre Co.

As Sound Deadening

Where *Masonite* is used on walls, ceilings, and floors, it has another important function, along with its structural and insulating values. The presence of dead air spaces in the structure not only stops heat passage, but absorbs a large part of the sound waves.

With the increasing demand for sound deadened construction, it is especially interesting to note that the use of *Masonite* provides excellent results without added cost. Where special sound deadeners can be used only at extra cost, this material pays for itself by structural or insulating service, and provides excellent sound deadening at the same time.

A complete report of various tests for insulating value, strength, absorption, etc., as reported by impartial engineering laboratories, is shown on pages 13, 14, and 15. Note these tests carefully and see for yourself the high rating given to Masonite by scientists.

MASONITE AS EXTERIOR SHEATHING and INSULATION for frame buildings with wood siding, or shingle finish

MATERIAL: Sheathing and insulation for all exterior walls shall be *Masonite Structural Insulation* 7/16″ thick, manufactured by the Mason Fibre Company, Chicago, Ill.

FRAMING: Studs, joists, sills and plates shall be framed as in ordinary frame construction. All studs shall be placed accurately on 16″ centers. Where horizontal joints are necessary, use 2″ x 4″ headers cut in between the studs. Any odd spaces required to make overall lengths shall be located in or near the middle. No extra cross bracing other than commonly used required. Fire stops and wind bracing are recommended.

APPLICATION: The *Masonite* boards shall be applied lengthwise, parallel and directly to the frame work, allowing ample bearing surface for nailing on all edges. Boards shall be placed 3/16″ apart at sides, top and bottom. DO NOT FORCE BOARDS INTO PLACE.

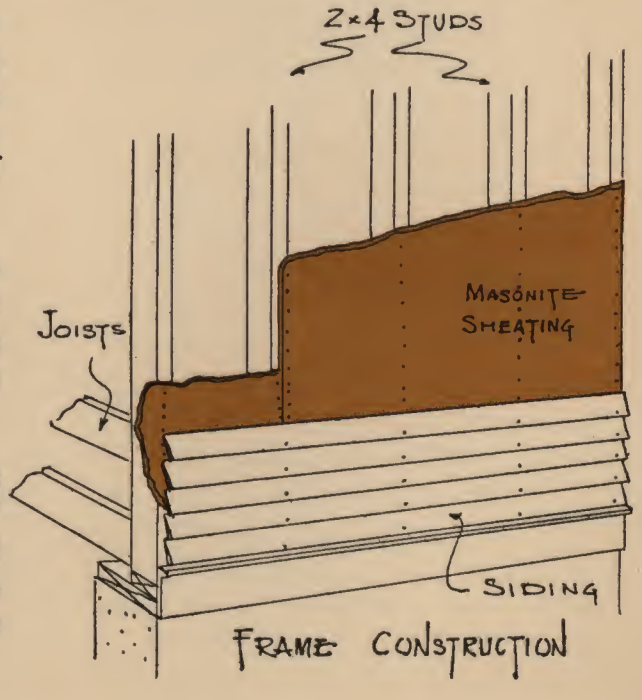
Around window and door frame, or where tight joints are wanted, bring *Masonite* to close contact. Nail 3″ strip of *Masonite* to build up back of frames.

Cut *Masonite* to fit snugly around rafters that project beyond face of studs.

NAILING: Beginning at top, nail *Masonite* first to intermediate studs, and then entirely around all edges of board to studs, sills, plates or headers. Use standard galvanized 1½″ roofing nails, with ⅜″ head, all nails to be 4″ apart and ⅜″ from all edges. Drive nails flush with surface of *Masonite*.

SIDE WALLS: Wood siding is applied directly over *Masonite* without the use of building paper, nailing through into studs. Siding boards shall butt on studs.

SHINGLE WALLS: If walls are to be shingled, furring strips 1″ x 2″ shall be applied over *Masonite* and nailed through into studs. Shingles to be applied in accordance with the manufacturer's specifications.



FRAME CONSTRUCTION

MASONITE AS EXTERIOR SHEATHING and INSULATION for frame buildings having either stucco, stone, or brick veneer finish

MATERIAL: Sheathing and insulation for exterior walls shall be *Masonite Structural Insulation* 7/16" thick, manufactured by the Mason Fibre Company, Chicago, Ill.

FRAMING: Studs, joists, sills and plates shall be framed as in ordinary frame construction. All studs shall be placed accurately on 16" centers. Where horizontal joints are necessary, use 2"x4" headers cut in between the studs. Any odd spaces required to make overall lengths shall be located in or near the middle. No extra cross bracing other than commonly used required. Fire stops and wind bracing are recommended.

APPLICATION: The *Masonite* boards shall be applied lengthwise, parallel and directly to the framework, allowing ample bearing surface for nailing on all edges.

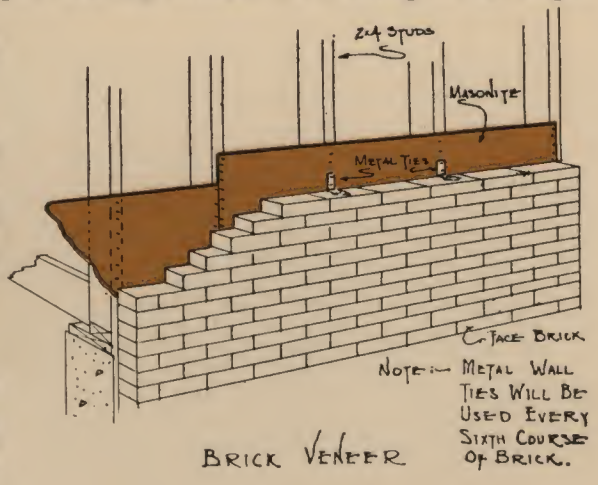
Boards shall be placed 3/16" apart at sides, top and bottom. DO NOT FORCE BOARDS INTO PLACE.

Around window and door frames, or where tight joints are wanted, bring *Masonite* to close contact. Nail 3" strip of *Masonite* to build up back of frames. Cut *Masonite* to fit snugly around rafters that project beyond face of studs.

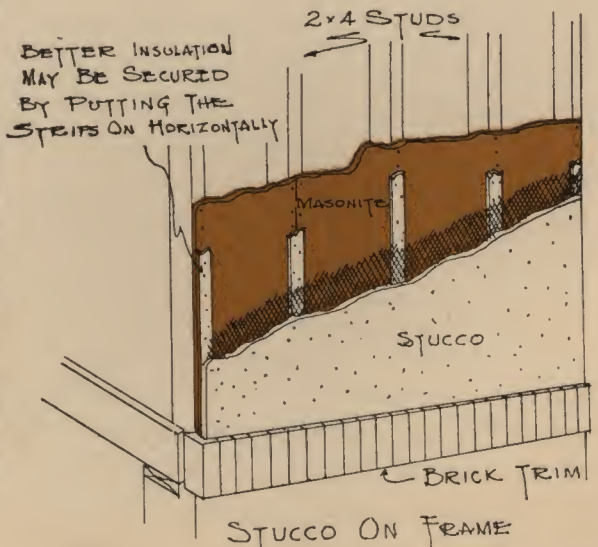
NAILING: Beginning at top, nail *Masonite* first to intermediate studs, and then entirely around all edges of board to studs, sills, plates or headers. Use standard galvanized 1½" roofing nail with 3/8" head, all nails to be 4" apart and 3/8" from all edges. Drive nails flush with surface of *Masonite*.

STUCCO FINISH: 1" x 2" wood furring strips for wood or metal lath shall be nailed through *Masonite* into each stud. *Apply all metal lath in accordance with the Associated Metal Lath Manufacturers' specifications.* Wood lath to be applied in customary manner. Stucco to be applied in accordance with stucco manufacturer's specifications. *No stucco to be applied direct to Masonite on exterior walls.*

STONE OR BRICK VENEER: Shelf angles, or metal ties, shall be nailed through *Masonite* into studs in customary manner. Stone or brick to be set out at least ½" from *Masonite*.



BRICK VENEER



STUCCO ON FRAME

MASONITE INSULATING LATH
as plaster base and insulation for frame and masonry walls, including partitions and ceilings

MATERIAL: Plaster base shall be *Masonite Insulating Lath* 24″ x 48″ x 7/16″, sides matched, manufactured by Mason Fibre Company, Chicago, Illinois.

FRAMING: Studs, joists, sills and plates shall be framed as in ordinary frame construction, all studs to be placed accurately on 12″ or 16″ centers.

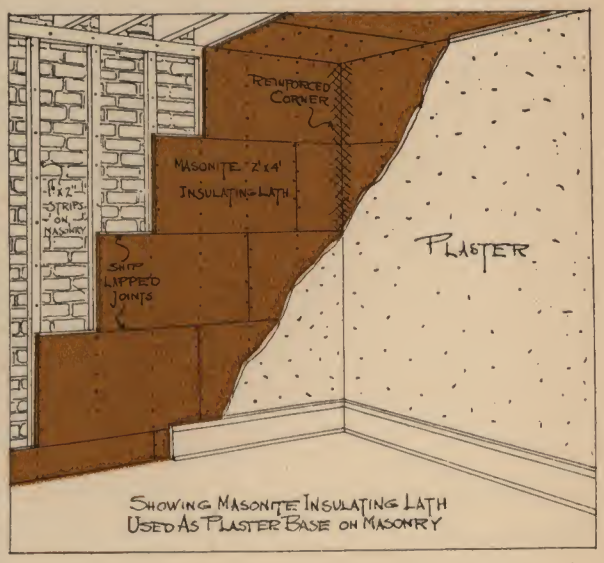
APPLICATION FOR FRAME: The *Masonite* boards shall be applied at right angles to the studding, joists, or rafters. Apply boards to break joints, space 3/16″ apart at all ends. Bring shiplap edges to close contact. DO NOT FORCE INTO PLACE.

Around window and door frames, or where tight joints are wanted, bring *Masonite* to close contact.

All corners shall be protected with galvanized metal lath or strips of screen wire from floor to ceiling nailed through *Masonite* to studs.

NAILING: Nail *Masonite* Plaster Base with 5d box nails every 4″. Nail intermediate studs first and then ends.

APPLICATION FOR MASONRY WALLS: Wood furring strips 1″ x 2″ shall be securely nailed to anchors in the masonry walls in approved manner on 12″ or 16″ centers before applying *Masonite*.

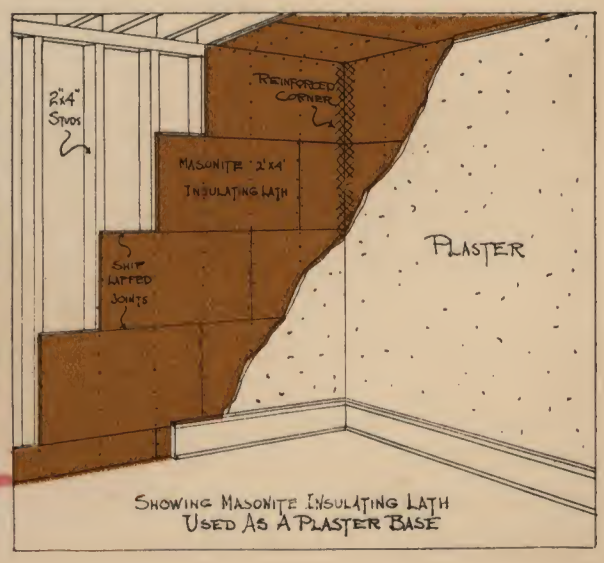


SHOWING MASONITE INSULATING LATH USED AS PLASTER BASE ON MASONRY

PLASTER: Quick setting gypsum plasters containing not more than 10 per cent lime shall be used. Plaster should set in about one and one-half hours, and not exceeding two hours. Apply plaster directly to surface of *Masonite*. The first coat, or scratch and brown coat together must have thickness of not less than 3/8″ and must be throughly dry before applying finish coat. Total thickness shall be not less than 1/2″.

The plasterer shall use the darby in the direction of the studding or joist, and it shall be of sufficient length to span two or more studs or joists.

NOTE: Wetting *Masonite* before applying plaster is recommended. Keep room being plastered well ventilated in both winter and summer. Lime plaster will not adhere to *Masonite*.



SHOWING MASONITE INSULATING LATH USED AS A PLASTER BASE

MASONITE STRUCTURAL INSULATION
as an interior finish

MATERIAL: All interior walls and ceilings shall be covered with *Masonite Structural Insulation* 7/16" thick, manufactured by the Mason Fibre Company, Chicago, Ill.

FRAMING: Studs, joists, sills and plates shall be framed as in ordinary frame construction. All studs shall be placed accurately on 16" centers. Where horizontal joints are necessary, use 2" x 4" headers cut in between the studs. No extra cross bracing other than commonly used required. Fire stops and wind bracing are recommended.

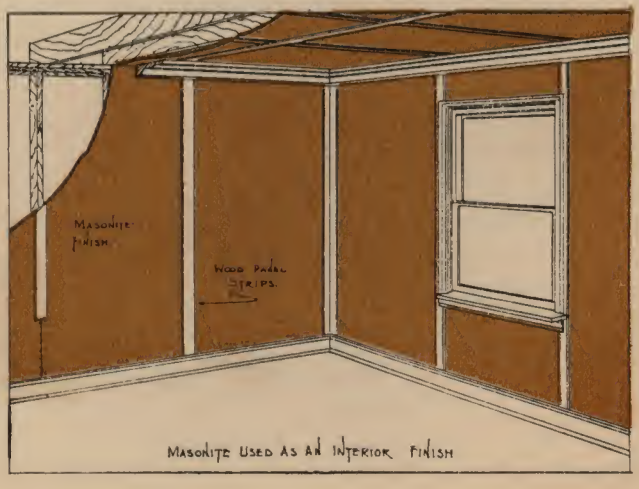
Consideration to be given for the design of paneling desired, using extra studs if necessary. Headers are recommended for the most substantial construction back of chair rail and all other moldings.

APPLICATION: *Masonite* boards shall be applied lengthwise, parallel to studs and directly to the framework, allowing ample bearing surface for nailing on all edges. Boards shall be placed 3/16" apart at sides, top and bottom. DO NOT FORCE BOARDS INTO PLACE.

Around the window and door frames, or where tight joints are wanted, bring *Masonite* to close contact. Nail 3" strips of *Masonite* to build up back of frames.

NAILING: Beginning at top, nail *Masonite* to intermediate studs with 1¾" finishing nails, driven at a 30 degree angle every 6". Heads to be countersunk with nail set. Nailing around edges is not necessary where panel strips are used. If no panel strips are used, nail edges with standard galvanized 1½" roofing nails with ⅜" heads, spacing them 4" apart and ⅜" from edge.

TRIM: Joints to be covered with wood battens ½" x 3", or suitable width, not less than 2" wide. *Masonite* battens can be used to secure more artistic finish. Base board and other trim to be as commonly used.



MASONITE USED AS AN INTERIOR FINISH

PAINTING AND DECORATING: *Masonite* can be left in its natural pleasing finish, or it may be stained without sizing, or painted over size or priming. See stain or paint manufacturer's specification.

SIZING, PAINTING, STAINING, TINTING OR PLASTIC PAINTS
on Masonite Structural Insulation

SIZING: In order to get maximum covering capacity for oil paints, *Masonite's* surface shall be sized or primed. Various standard sizes offered on the market may be used and we recommend the following:

Dissolve two pounds of shell or chip glue in three gallons of boiling water and apply. A second coat may be applied four to six hours later, if desired. Second coat should be diluted with one quarter volume water. All applied when warm.

PRIMING: A priming coat containing ⅓ turpentine, ⅓ boiled linseed oil and ⅓ pigment may be used in place of sizing.

PAINTING: Paint or stain may be applied as in ordinary method over size, or priming coat.

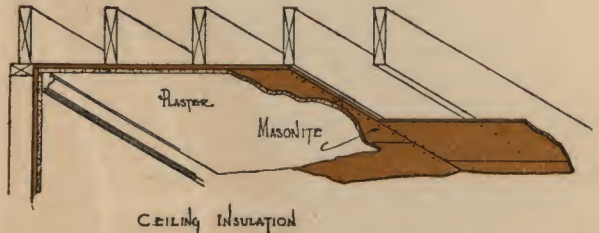
STAINING: Any stain, whether oil, benzol, alcohol, or acid may be applied over glue size in usual manner or without size.

WATER STAINS: Water stains, and all commercial stains used for dyeing wood can be used over *Masonite*, without sizing, applied according to stain manufacturer's specifications. *Masonite* will take pastewater stains without first sizing.

SPECIAL FINISHES: Plastic paints, textured wall finishes, etc., can be applied direct to *Masonite*. Follow manufacturer's specification in every case. *Use Masonite Structural Insulation (full size boards, not 2' x 4' Insulating Lath.)*

NOTE: DO NOT use size or priming, where acoustical correction is desired. Ordinary stain may be used.

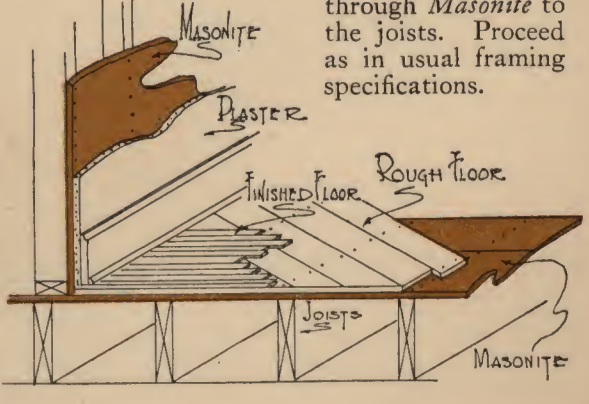
CEILING AND FLOOR INSULATION



Ceiling Insulation

For ceiling insulation, as illustrated, nail *Masonite Insulating Lath* directly to joists, using standard 5d box nails when plaster is to be applied. Proceed as in usual framing specifications.

For floor insulation, nail *Masonite* (full size boards) directly to joists, using standard 1½" roofing nails with ⅜" heads. Nail rough floor through *Masonite* to the joists. Proceed as in usual framing specifications.



Showing Floors

MASONITE STRUCTURAL INSULATION
as roof insulation under wood rafters

NOTE: Application of *Masonite* under wood rafters is specified for the insulation of existing roofs and also for new shingled roofs of wood, slate, zinc, copper and all other types of roof covering materials requiring a solid wood deck for nailing.

MATERIAL: Insulation shall be *Masonite Structural Insulation* 7/16" thick, manufactured by the Mason Fibre Company, Chicago, Illinois.

FRAMING: The rafters shall be spaced 16" on centers. Whenever it is necessary to have a horizontal joint in the *Masonite*, a 2" x 4" header shall be cut in between the rafters.

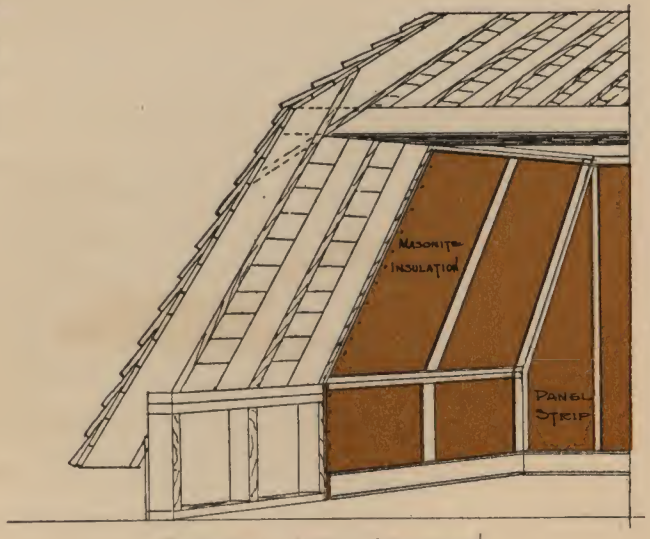
APPLICATION: The *Masonite* boards shall be applied lengthwise of, and directly to the rafters, and set in place to have a bearing for nailing along all edges.

NAILING: At top and bottom of boards and also between adjoining boards, leave 3/16" space. Wherever a snug joint is desired around openings, atcorners, etc. fit *Masonite* carefully and bring to moderate contact. *MASONITE* SHOULD NOT BE FORCED INTO PLACE.

INTERIOR FINISH: If interior finish is wanted, care must be taken in laying out rafters, studs and headers for the paneling design required. Intermediate rafters, studs and headers to be nailed with 1¾" finishing nails every 6" at a thirty degree angle. For nailing sides and ends see specification No. 4. Panel strips to be ½" x 3" of suitable material.

PLASTER BASE: When plaster is to be applied, *Masonite* Insulating Lath shall be used and shall be applied in accordance with specification No. 3, Page 6.

Many unusually artistic battens and all-over decorative effects can be secured with Masonite. By using a special cutting tool, or by sanding strips of Masonite, many different designs can be made quickly and easily.



SHOWING ATTIC INSULATION.

MASONITE AS ROOF AND CEILING INSULATION on top of wood rafters

NOTE: The use of *Masonite* on top of wood rafters is applicable for roofs of wood shingle, asbestos shingle, etc.

MATERIAL: Roof insulation shall be *Masonite Structural Insulation* 7/16" thick, manufactured by the Mason Fibre Company, Chicago, Illinois.

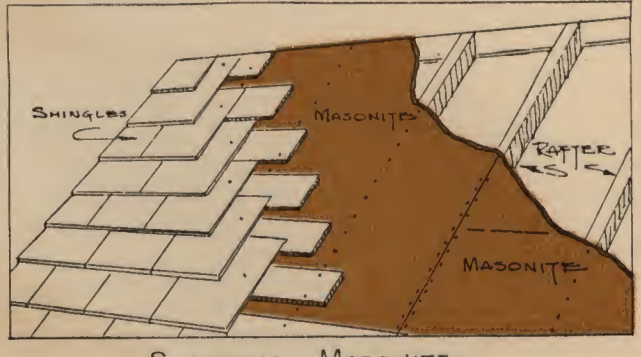
FRAMING: Space rafters 16" on centers. Cut in a 2" x 4" header wherever there is a horizontal joint in the *Masonite*. Provide suitable pieces for a nailing base at the ends of all rafters, ridges, hips, valleys, etc.

APPLICATION: Apply *Masonite* parallel and directly to the rafters and set so as to leave a bearing for nailing along all edges.

At top and bottom of *Masonite* boards and between adjoining boards, leave 3/16" space. Around corners, gables, openings, chimneys and at the meeting of roof insulation and wall sheathing, or where a snug joint is desired, the *Masonite* shall be fitted carefully and brought to moderate contact. *MASONITE* SHOULD NOT BE FORCED INTO PLACE.

NAILING: *Masonite* shall be nailed first to intermediate rafters and headers, then nailed around all edges of each board to rafters and headers and nailing pieces. Nails shall be standard 1½" roofing nails with 3/8" heads, spaced 4" apart. Drive heads flush with the surface of the *Masonite*. Place nails approximately 3/8" from the edge of the boards.

COVERINGS NAILED TO SHINGLE LATH: For wood shingles, asbestos shingles and tile roofs, apply wood sheathing over *Masonite* in the usual manner, nailed through to rafters.



SHOWING MASONITE NAILED TO RAFTERS

MASONITE AS ROOF INSULATION
over concrete and wood decks

MATERIAL: Roof Insulation shall be *Masonite Roof Insulation*, 7/16" thick, cut 4' x 4', manufactured by the Mason Fibre Company, Chicago, Illinois.

PREPARATION OF CONCRETE DECK: The roof deck shall be reasonably smooth, dry, well cured and free from all rubbish. Before applying *Masonite*, the roof deck shall be swept clean. The concrete deck shall be primed with a standard concrete primer in the customary manner.

APPLICATION OVER CONCRETE DECK: A heavy uniform coat of asphalt or hot roofing pitch shall be applied for mopping. Use not less than thirty pounds per 100 sq. ft. Mop one sheet at a time. Press *Masonite* firmly into place while mopping is hot. All edges must be pressed into mopping. Edges should be brought to moderate contact. DO NOT FORCE INTO PLACE. Break all transverse joints and joints of successive layers.

To apply more than one layer of *Masonite*, mop the top surface of the previous layer and proceed as above.

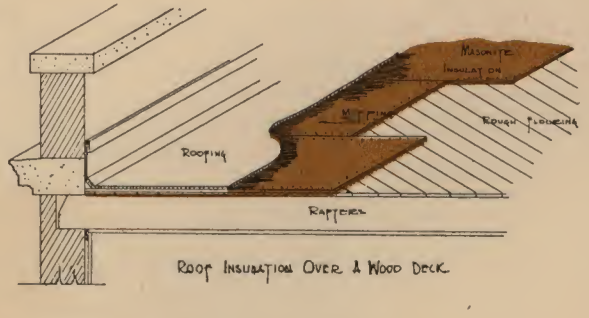
PREPARATION OF WOOD DECK: Material shall be seasoned, matched and dressed lumber, properly nailed, with all nails driven flush. Lay deck to slope and pitch to drain in accordance with plans and specifications. Sweep deck clean before laying *Masonite*. Nail cant strips around walls and where required.

APPLICATION OVER WOOD DECK: The first layer of *Masonite* shall be nailed to wood deck, using 1½" standard roofing nail, with ⅜" head, and spaced 12" on centers, nailed flush with surface. Nails in body of board to be staggered.

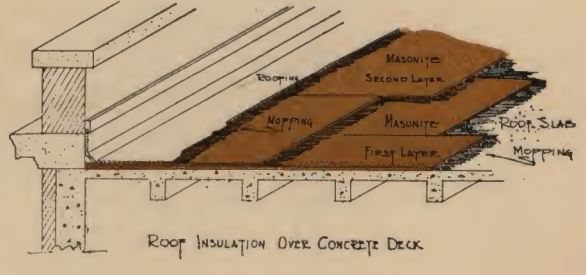
Follow architects', engineers' or manufacturer's specifications in application of roofing. Whenever only one layer of *Masonite* is used and there is any possibility of pitch drippage, cover entire roof area with a sheet of rosin sized sheeting or unsaturated felt before laying *Masonite*.

In applying *Masonite Roof Insulation* on roof decks to prevent condensation and also for insulation, follow heating engineers' specifications.

NOTE: Roof slab and surface of *Masonite* must be dry before mopping and applying, as asphalt or hot pitch will not adhere properly over moist surfaces. Spot mopping of the roof deck or mopping only between courses of *Masonite* is not sufficient.

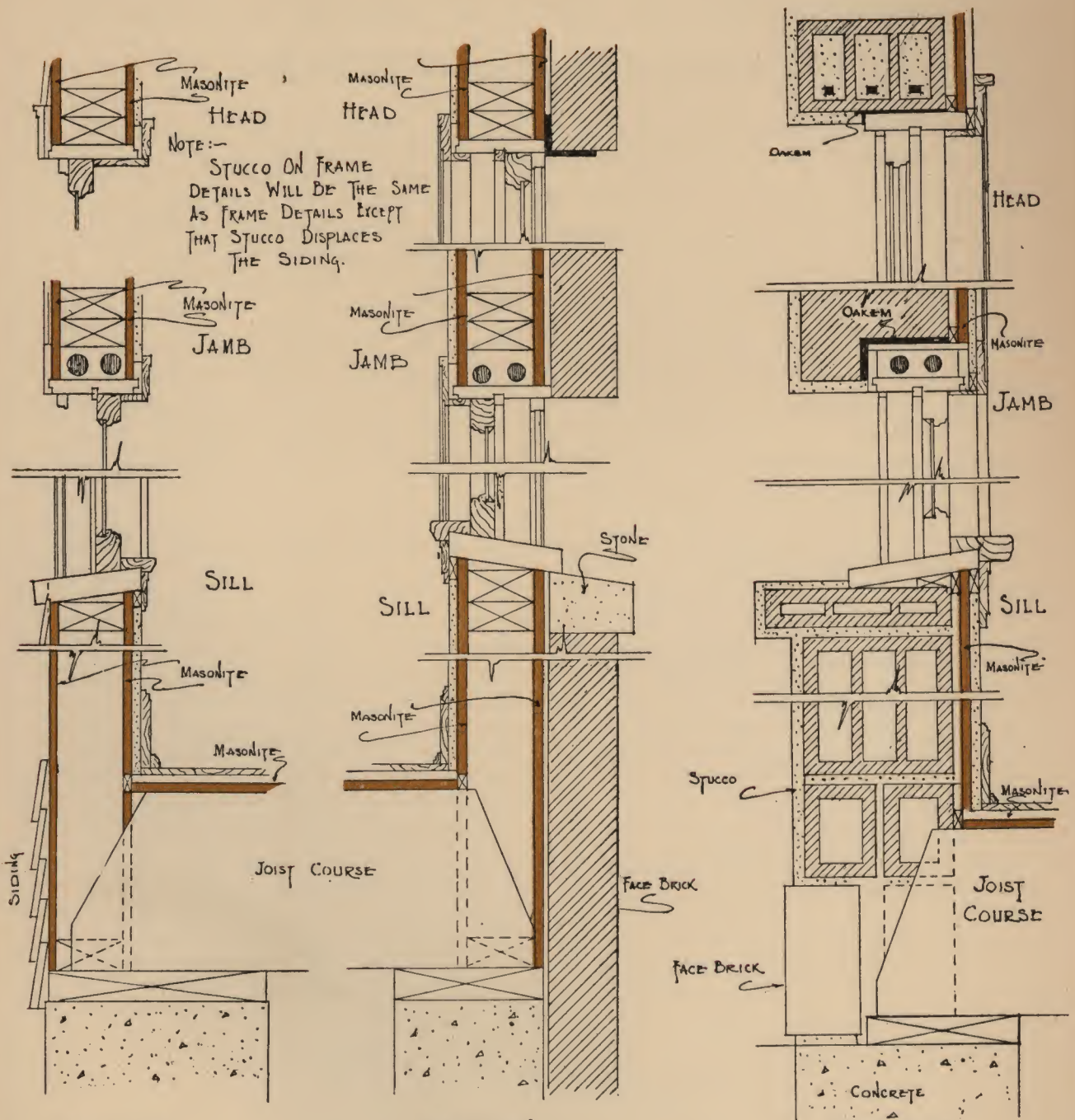


Roof Insulation Over a Wood Deck



Roof Insulation Over Concrete Deck

TYPICAL WALL SECTIONS



INSULATION VALUES

There are two standard methods of testing the conductivity of an insulating material, and finding the exact heat loss through that material.

Both of these methods, the "flat plate test" and the "hot box test," were applied to *Masonite* by G. F. Gebhardt, of the Armour Institute of Technology, a nationally noted authority on insulation tests.

The coefficients found by this impartial authority are both remarkably low. Compare them with published test data on similar materials and you can see for yourself why *Masonite* should be specified wherever a job calls for the maximum insulating value per dollar.

G. F. GEBHARDT

MECHANICAL ENGINEER

INSPECTION, TESTS AND CONSULTATION — OFFICE AND LABORATORIES ARMOUR INSTITUTE OF TECHNOLOGY

CHICAGO

October 5, 1926

Mason Fibre Company
111 W. Washington St.
Chicago, Illinois

Gentlemen:-

We submit herewith our report covering tests which we have conducted to determine the rate of heat flow through samples of your insulating fiber board known as "Masonite". The test samples used in this investigation were shipped to us by express from your factory at Laurel, Mississippi.

In this investigation we have used two distinct methods as follows:

First: The flat plate test in which the sample is placed between two metal plates one of which is heated electrically and the other cooled with water. This method gives the coefficient of heat conductivity, surface to surface. In the table below we have expressed it in B.t.u's. per hour and per day per square foot of surface per degree Fahrenheit difference in temperature between the surfaces of the material for a one inch thickness.

Second: The hot box method in which the material to be tested forms the top of a calibrated box which is heated electrically. In this case the material is subject to air contact on both sides and the result obtained is the overall coefficient of heat transmission. In the table below we have expressed this coefficient in B.t.u's. per hour and per day per square foot of surface per degree Fahrenheit difference in temperature between the inside and the outside air for a one inch thickness.

The results are as follows:

Mason Fibre Company

Flat Plate Test

Material	Thickness Inches.	Density Lbs.Cu.Ft.	Coefficient of Heat Conductivity Per Inch Thick Per Hour	Per Day
Masonite	0.47	19.8	0.328	7.87

Hot Box Test

Material	Thickness Inches.	Density Lbs.Cu.Ft.	Coefficient of Heat Transmission Per Inch Thick Per Hour	Per Day
Masonite	0.47	19.7	0.253	6.07

Respectfully submitted,
G. F. GEBHARDT.

Per J. C. Peebles.

Testing Engineer:
J. C. Peebles.

Note how nearly the "hot box test" parallels the conditions of a building in winter. High temperature inside the structure, low temperature outside, and between these two extremes a wall of *Masonite*, that KEEPS HEAT WHERE IT BELONGS.

ROBERT W. HUNT COMPANY, ENGINEERS

CHICAGO PITTSBURGH NEW YORK
LONDON ST. LOUIS SAN FRANCISCO

FILE NO 22622-1 ORDER B-63191
REPORT 21079-80-81-82

Chicago, Illinois.
October 11, 1926.

Mason Fibre Company,
111 W. Washington St.,
Chicago, Illinois.

Gentlemen:-

Below we hand you the results of tests on samples of Insulation Board submitted with your letter of September 23, 1926:

Tensile Tests

Specimen Cut From	Width Tested	Thick-ness	Tensile Strength per sq. in.	
Width	2"	0.450"	206#)	Average of
"	2"	0.450"	203#	
"	2"	0.450"	199#)	3 tests=203#

Transverse Test

Width tested - 6 in. Thickness - 0.450 in.

Distance between Supports	Maximum Load	Deflection at maximum Load
12 in.	31#	3/8 in.
12 in.	35#	1/2 in.
12 in.	32#	3/8 in.

Absorption Tests

Two samples 12 in. square were tested for water absorption, the cut edges first being sealed with paraffin. Sample No. 1 was immersed to a depth of 1/2 in. and Sample No. 2 to a depth of 1-1/2 in.

ROBERT W. HUNT COMPANY, ENGINEERS

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Mason Fibre Company.

Sample	No. 1	No. 2
Depth of Immersion	1/2 in.	1-1/2 in.
Size of sample	12"x12"x0.45"	12"x12"x0.45"
Original weight dry	422 gram	398 gram
Weight after 4 hr. immersion	450 "	425 "
" " 8 hr. "	451 "	427 "
" " 24 hr. "	500 "	472 "
" " 48 hr. "	545 "	516 "
" " 72 hr. "	595 "	562 "
Absorption by weight in 4 hrs.	6.64%	6.78%
" " " 8 hrs.	6.87%	7.29%
" " " 24 hrs.	18.48%	18.59%
" " " 48 hrs.	29.15%	29.65%
" " " 72 hrs.	40.99%	41.21%
Absorption by volume in 4 hrs.	2.64%	2.54%
" " " 8 hrs.	2.73%	2.73%
" " " 24 hrs.	7.34%	6.97%
" " " 48 hrs.	11.58%	11.11%
" " " 72 hrs.	16.29%	15.44%

Respectfully submitted,

ROBERT W. HUNT COMPANY.

GBG:AB G B Grant

MASONITE STRENGTH

Under the tests of the Robert W. Hunt Co., internationally famous engineers, *Masonite* showed an average tensile strength of *203 pounds* per square inch, a load far greater than any ordinary structural job will ever put on it.

On transverse tests, a piece of stock *Masonite* only 6 inches wide, resting on supports 12 inches apart, carried a load of 32 pounds with a maximum deflection, or bend, of only 3/8 of an inch.

ABSORPTION TESTS

One of the most surprising facts about *Masonite*, as revealed under test, is its extremely low absorption of moisture. It is more highly resistant to moisture than other materials with which it is commonly compared.

Robert W. Hunt Company engineers found, for example, that after a piece of stock *Masonite* had been completely submerged in water for four hours, it had absorbed only a little over 2½% of its volume and only 6.78% of its weight.

ROBERT W. HUNT COMPANY, ENGINEERS

CHICAGO PITTSBURGH NEW YORK
LONDON ST. LOUIS SAN FRANCISCO

FILE NO 22622-1 ORDER B-63191
REPORT 21201-2

Chicago, Illinois.
October 27, 1926.

Mason Fibre Company,
111 W. Washington St.,
Chicago, Illinois.

Gentlemen:-

Below we hand you the results of tests on samples of Structural Insulation submitted, made to determine the holding power of Nails in this material.

For this test samples 10"x10" were used. Four holes (90° apart) were bored through the sample through which bolts were passed. The bolt heads fitted with 1" washers engaged the under side of the sample. The specimen was then nailed to a piece of Norway Pine, 10"x10"x2" (counter sunk to receive the bolt heads and washers) with four nails 90° apart spaced as indicated. The projecting ends of these bolts were engaged in another block. Tension was applied in direction of the axis of the nails, tending to pull the nails from the wood or the nail heads through the Insulation material.

The tests were made with both Barbed Roofing Nails and 6-d Common Nails, tests being made on 4" and 6" spacing on each.

	Diameter of Head	Diameter of Shank	Length
Barbed Roofing Nails	5/16"	0.139"	1-1/2"
6-d Common Nails	1/4"	0.112"	2"

Test Number	No. of nails in specimen	Type of Nails	Spacing of Nails	Maximum Load
1	4	Barbed Roofing	4"	260#
2	4	"	4"	260#
3	4	"	4"	255#
4	4	"	6"	200#
5	4	"	6"	195#
6	4	"	6"	205#
7	4	6-d Common	4"	235#
8	4	"	4"	225#
9	4	"	4"	245#
10	4	"	6"	195#
11	4	"	6"	190#
12	4	"	6"	190#

On all the above tests the nail heads pulled through the insulation material.

Respectuflly submitted,

ROBERT W. HUNT COMPANY.

GBG:AB G B Grauel

NAIL HOLDING

As these tests show, *Masonite* holds nails with remarkable tenacity. Although this material has the *appearance* of being rather "soft," it takes an average load of *258 pounds* to break the grip of only four 5/16" roofing nail heads on a 10" x 10" board. Four 6-d common nails, with 1/4" heads, hold a similar board against an average pull of *235 pounds*.

PLASTER BOND

The comparatively smooth surface of *Masonite* is apt to be misleading when considered as a base for plaster to "grip." But, under test, the actual bond between *Masonite* and plaster is not merely "good enough" but far greater than the ordinary wood-lath-and-plaster bond.

The lowest bond shown in three separate tests by the Robert W. Hunt Company was exactly one thousand pounds per square foot! A half ton pull was necessary to break the bond!

The average bond shown by three successive tests on stock material was even higher, running 1066.67 pounds per square foot!

ROBERT W. HUNT COMPANY, ENGINEERS

CHICAGO PITTSBURGH NEW YORK
LONDON ST. LOUIS SAN FRANCISCO

FILE NO. 22622-1 ORDER B-63191
REPORT 21194

Chicago, Illinois.
October 26, 1926.

Mason Fibre Company,
111 W. Washington St.,
Chicago, Illinois
Gentlemen:-

Below we hand you the results of tests made on samples of Structural Insulation submitted to determine the strength of bond when Wood Fibre Plaster was applied to this material. For these tests pieces 6 in. square were used, a 1/2 in. thickness of Wood Fibre Plaster being applied to both faces. After drying out for one week, wood blocks were bonded to the plaster surface. The specimens were pulled apart with the following results:

Test Number	Dimensions of bonded surface	Area of bonded Surface	Load per square foot of bonded surface
1	6" x 6"	36"	1,000#
2	6" x 6"	36"	1,120#
3	6" x 6"	36"	1,080#

On the above three tests, the failure occurred through the insulation material, no failure taking place between the plaster and the insulation.

Respectfully submitted,

ROBERT W. HUNT COMPANY.

GBG:AB G B Grauel

Heat Loss and Condensation Charts

The charts shown here are an aid to the quick calculation of two factors commonly affected by the use of insulating materials.

Heat losses through various types of roofs are reduced to a definite showing in tons of coal per thousand feet of surface.

For example, reference to the Heat Loss Chart will show at a glance that a five-ply pitch and gravel roof with a 7/8" wood deck will lose a coal value of 2.8 tons per thousand feet of area in one heating season, when exposed to an average difference in temperature of 40° and uninsulated. The same roof, insulated with one layer of *Masonite*, loses only 1.8 tons during one heating season.

The same calculations are made for seven types of roof, with the effect of each of the important factors indicated throughout.

Definite reduction of heat losses to an expression in tons of coal will be found highly valuable in many cases.

Condensation on inner walls is also shown by the chart, which lists the exact point at which condensation commences on various types of construction, at various temperatures and humidities.

The *Condensation Chart* similarly shows, for example, that under a roof of the five-ply pitch and gravel type, condensation begins with a relative humidity of 50%, when the difference in temperature is 70° and the roof uninsulated. One layer of *Masonite* under these conditions stops condensation up to a humidity of 70%, while two layers stop it until the humidity reaches 80%.

This quick easy method of predetermining condensation factors and heat losses is a valuable one, and should be used whenever possible.

TYPE OF ROOF

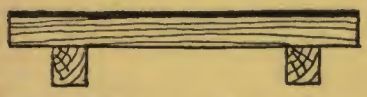
CHART SHOWING WHETHER OR NOT CONDENSATION WILL FORM ON BOTTOM OF ROOF DECK

BLACK INDICATES DANGER OF CONDENSATION
WHITE INDICATES NO CONDENSATION

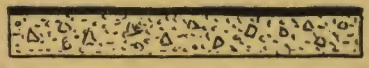
UNINSULATED	WITH ONE LAYER OF MASONITE	WITH TWO LAYERS OF MASONITE
PERCENT RELATIVE HUMIDITY 10 20 30 40 50 60 70 80 90	PERCENT RELATIVE HUMIDITY 10 20 30 40 50 60 70 80 90	PERCENT RELATIVE HUMIDITY 10 20 30 40 50 60 70 80 90

TEMPERATURE DIFFERENCE 10 20 30 40 50 60 70 80 90

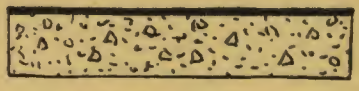
5 PLY PITCH & G. ROOF
7/8" WOOD DECK (Soft Wood)



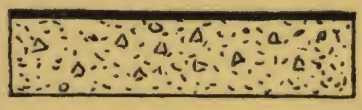
5 PLY PITCH & G. ROOF
1 3/4" WOOD DECK (Soft Wood)



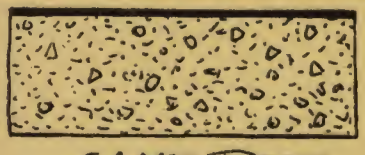
5 PLY PITCH & Gravel Roof
2" CONCRETE DECK



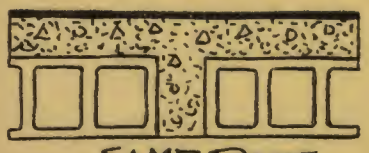
SAME ROOF
3" CONCRETE DECK



SAME ROOF
4" CONCRETE DECK



SAME ROOF
6" CONCRETE DECK



SAME ROOF
2" CONCRETE 6" HOLLOW TILE